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FROM: MATTHEW C. LOPPNOW (847) 523-2585  
(SENDER'S NAME) (EXTENSION)

RE: APPLICATION NO. 09/667,641

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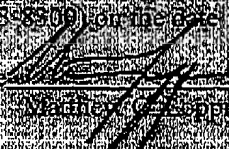
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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT(S) Zili Li GROUP ART UNIT: 2871  
APPLN. NO.: 09/667,641 EXAMINER: TON, MINH TOAN T  
FILED: 09/23/2000  
TITLE: LIQUID CRYSTAL DEVICE HAVING VARIABLE REFLECTED  
WAVELENGTH

5

Motorola, Inc.  
Intellectual Property Department  
600 North U.S. Highway 45  
Libertyville, IL 60048

10

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

15 MS Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

20 Sir:

Further to the Notice of Appeal filed on August 16, 2006, Applicant submits the  
present Appeal Brief.

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# **I. REAL PARTY IN INTEREST**

The real party in interest is, Motorola, Inc.

## **II. RELATED APPEALS AND INTERFERENCES**

There are no related appeals or interferences.

## **III. STATUS OF CLAIMS**

Claims 1-17 are pending of which claims 4-17 are withdrawn. Claims 1-3 are rejected and are the subject of the present appeal.

## **IV. STATUS OF AMENDMENTS**

No amendments were filed subsequent to final rejection.

## **V. SUMMARY OF CLAIMED SUBJECT MATTER**

### Claim 1

Claim 1 is drawn generally to a liquid crystal device. The liquid crystal device includes a transparent front plate (Fig. 1, element 6, page 5, line 7), a back plate (Fig. 1, element 8, page 5, lines 7-8) spaced apart from the transparent front plate, a cholesteric liquid crystal material (Fig. 1, element 4, page 6, lines 17-18) between said transparent front plate and said back plate, said cholesteric liquid crystal material having a reflective state wherein said cholesteric liquid crystal material reflects light through said front plate, said light characterized by a first wavelength in the absence of an applied electric field, and means (Fig. 1, element 28) for applying an electric field, parallel to the back plate, to said cholesteric liquid crystal material in the reflective state to cause said cholesteric liquid crystal material to reflect light characterized by a second wavelength different than said first wavelength (page 7, line 3 - page 8, line 8).

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## VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claim 1 is allowable under 35 U.S.C. §103 over Buzak (U.S. Patent No. 4,726,663) and Kondo (U.S. Patent No. 5,598,285).

5

## VII. ARGUMENT

### Claim Limitations At Issue

10 In Claim 1, the limitations at issue are italicized below:

1. A liquid crystal device comprising  
a transparent front plate;  
a back plate spaced apart from the transparent front plate;  
15 *a cholesteric liquid crystal material between said transparent front plate and said back plate, said cholesteric liquid crystal material having a reflective state wherein said cholesteric liquid crystal material reflects light through said front plate, said light characterized by a first wavelength in the absence of an applied electric field; and*  
*means for applying an electric field, parallel to the back plate, to said*  
20 *cholesteric liquid crystal material in the reflective state to cause said cholesteric liquid crystal material to reflect light characterized by a second wavelength different than said first wavelength.*

### Examiner's Allegation

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Claim 1 stands rejected under 35 U.S.C. §103 over Buzak (U.S. Patent No. 4,726,663) and Kondo (U.S. Patent No. 5,598,285).

### Applicants' Argument

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Applicants assert the Office Action has not provided a prima facie case of obviousness because there is no suggestion or motivation to modify the references to achieve the claimed invention.

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To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the reference or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references, when combined, must teach or suggest all of the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure (MPEP 2142). The prior art must suggest the desirability of the claimed invention (MPEP 2143.01).

Buzak uses a three-pair or six chiral layer stack to form a device that can selectively tune colors within three primary colors in a discrete fashion. For example, chiral liquid crystal cells 22 and 24 are tuned to the respective colors green and red. Chiral liquid crystal cells function in a manner similar to that described for a cholesteric layer (col. 3, lines 27-52). The Office Action admits Buzak does not disclose a means for applying an electric field parallel to the back plate.

Kondo teaches a liquid crystal display device. However, applicants assert the teachings of Kondo cannot be combined with the teachings of Buzak because Kondo deals with a completely different liquid crystal from Buzak. In particular, Kondo has nothing to do with cholesteric liquid crystal or the chiral liquid crystal taught in Buzak. Kondo does not disclose any use with chiral liquid crystal. In fact, the teachings of Kondo cannot be combined with the teachings of Buzak because Kondo expressly discloses the use of nematic liquid crystal, as opposed to chiral liquid crystal. For example, regardless of whether Kondo does not teach an in-plane field, Kondo teaches using a field to only switch a nematic liquid crystal. For example, Kondo expressly discloses there are strict characteristics and requirements for the use of a twisted nematic type, which limits materials that can be used with the teachings of Kondo. While the teachings of Kondo do allow for the range of material selection to be increased, the teachings still only apply to nematic liquid crystal, not the chiral liquid crystal taught in Buzak.

The Office Action alleges the teachings of Kondo provide an advantage such as a wide viewing angle. However, Kondo does not teach the advantage is applicable to the cholesteric liquid crystal taught in Buzak.

Furthermore, the type of switching used in Kondo cannot provide the claimed feature of causing a cholesteric liquid crystal material to reflect light characterized by a second wavelength different from a first wavelength. Such a fact is clear to one of ordinary skill in

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the art because in Kondo there is no helical structure with the liquid crystal layer between the front plate and the back plate. Accordingly, one of ordinary skill would not be motivated to combine the teachings of the references to achieve the claimed elements.

Applicants recognize that one reading the claimed invention may begin to recognize numerous benefits that suddenly become apparent only after reading the claimed invention. The more the exact words of the claims are read, the more one can realize the benefits only became apparent after reading Applicants' teachings. Upon reaching this realization, it is easy to notice that there is absolutely no evidence of motivation in the prior art and such evidence has not been provided by the Office Action. Furthermore, the Office Action has not alleged motivation is based on the nature of the problem to be solved or based on the knowledge of persons of ordinary skill in the art. Yet, such motivation is required for a proper rejection under 35 USC § 103 (*see* MPEP § 2143.01). Thus, once one notices there is no evidence of motivation in the prior art, one can understand that the Office Action has applied impermissible hindsight in attempting to combine the references.

Thus, the Office Action has not provided a *prima facie* case of obviousness because there is no suggestion or motivation to modify the references to achieve the claimed invention.

Therefore, Applicants respectfully submit that independent claim 1 defines patentable subject matter. The remaining claims depend from the independent claims and therefore also define patentable subject matter.

Accordingly, kindly reverse and vacate the rejection of claim 1 under 35 U.S.C. § 103, with instructions for the Examiner to allow claims 1-3.

#### CONCLUSION

In view of the discussion above, the claims of the present application are in condition for allowance. Kindly withdraw any rejections and objections and allow this application to issue as a United States Patent without further delay.

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The Commissioner is hereby authorized to deduct the fees for filing a brief in support of an appeal and any fees arising as a result of this Appeal Brief or any other communication from or to credit any overpayments to Deposit Account No. 50-2117.

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Respectfully submitted,



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### VIII. CLAIMS APPENDIX

Claims involved in the appeal:

5           1.       (previously presented) A liquid crystal device comprising  
a transparent front plate;  
a back plate spaced apart from the transparent front plate;  
a cholesteric liquid crystal material between said transparent front plate and  
said back plate, said cholesteric liquid crystal material having a reflective state wherein said  
10 cholesteric liquid crystal material reflects light through said front plate, said light  
characterized by a first wavelength in the absence of an applied electric field; and  
means for applying an electric field, parallel to the back plate, to said  
cholesteric liquid crystal material in the reflective state to cause said cholesteric liquid crystal  
material to reflect light characterized by a second wavelength different than said first  
15 wavelength.

2.       (original) The cholesteric liquid crystal device of claim 1 wherein the  
cholesteric liquid crystal material in said reflective state comprises molecules in a helical  
arrangement having a helical axis in a first direction, and said means is adapted to apply an  
20 electric field in a second direction nonparallel to the first direction.

3.       (original) The cholesteric liquid crystal device of claim 2 wherein the  
cholesteric liquid crystal material in said reflective state is characterized by a first pitch in the  
absence of an applied electric field and wherein said means is adapted to apply an electric  
25 field effective to produce a second pitch different from the first pitch.

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4. (withdrawn) A liquid crystal display device comprising

a transparent front plate;

a back plate spaced apart from said front plate;

a cholesteric liquid crystal layer between said transparent front plate and said

5 back plate, said cholesteric liquid crystal layer comprising a cholesteric liquid crystal material  
switchable in response to an applied electric field applied along a first direction between a  
transparent state and a reflective state, said cholesteric liquid crystal material in said reflective  
state being effective to reflect light characterized by a first wavelength through the transparent  
front plate; and

10 means for applying an electric field to said cholesteric liquid crystal material in  
a second direction distinct from the first direction to cause said cholesteric liquid crystal  
material in the reflective state to reflect light characterized by a second wavelength different  
than said first wavelength.

15 5. (withdrawn) The liquid crystal display device of claim 4 wherein the second  
direction is perpendicular to the first direction.

6. (withdrawn) The liquid crystal display device of claim 4 wherein the first  
direction is perpendicular to the transparent front plate.

20

7. (withdrawn) The liquid crystal display device of claim 4 wherein the first  
wavelength corresponds to light having a blue color.

25

8. (withdrawn) A liquid crystal display comprising  
a transparent front plate;

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a back plate spaced apart from said front plate;

a cholesteric liquid crystal layer between said transparent front plate and said back plate and having a region, said cholesteric liquid crystal material comprising a cholesteric liquid crystal material switchable between a transparent state and a reflective state wherein said liquid crystal material reflects light having a first wavelength through said front plate;

first electrodes adjacent said cholesteric liquid crystal material layer at said region for applying a first electric field to switch said cholesteric liquid crystal material between the transparent state and the reflective state; and

second electrodes located adjacent said cholesteric liquid crystal material about said region for applying a second electric field across said region to cause said liquid crystal material at said region to reflect light at a second wavelength different than said first wavelength.

9. (withdrawn) The cholesteric liquid crystal display of claim 8 wherein said first pair of electrodes apply the first electric field along a first direction perpendicular to the transparent front plate, and

wherein the second pair of electrodes applies the second electric field along a second direction perpendicular to the first direction

10. (withdrawn) The cholesteric liquid crystal display device of claim 8 wherein the cholesteric liquid crystal material reflects blue light in the reflective state in the absence of a second applied electric field.

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11. (withdrawn) The cholesteric liquid crystal display of claim 8 wherein the second electric field is obtained by applying a voltage across the second electrodes between about 5 to 500 volts.

5 12. (withdrawn) A cholesteric liquid crystal display device comprising  
a transparent front plate,  
a back plate spaced apart from the transparent front plate,  
a layer between the transparent front plate and the back plate and comprising a  
plurality of pixels, each said pixel comprising a first subpixel and a second subpixel adjacent  
10 the first subpixel, said layer composed of a cholesteric liquid crystal material switchable  
between a transparent state and reflective state, wherein said cholesteric liquid crystal material  
in said reflective state reflects light at a first wavelength in the absence of an applied electric  
field,

first electrodes at said first subpixel for applying a first electric field in a first  
15 direction to switch said cholesteric liquid crystal material at said first subpixel between the  
transparent state and the reflective state,

means for applying a second electrical field at the first subpixel in a second  
direction different from the first direction to cause said cholesteric liquid crystal material at  
said first subpixel to reflect light at a second wavelength different from the first wavelength,  
20 and

electrodes at said second subpixel for applying an electric field to switch said  
cholesteric liquid crystal material between said transparent state and said reflective state, such  
that said electrodes at said second subpixel switch said cholesteric liquid crystal at said second  
subpixel independent from the first subpixel.

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13. (withdrawn) The cholesteric liquid crystal displaying device of claim 12 wherein said means for applying a second electric field at the first subpixel comprises a pair of electrodes distinct from the electrodes for applying the first electric field.

5 14. (withdrawn) The cholesteric liquid crystal display device of claim 12 wherein said second subpixel reflects light of a first color and wherein said first subpixel reflects light of a second color distinct from the first color, and wherein the light from the first subpixel and the second subpixel combine such that light from the pixel is perceived to be a third color.

10 15. (withdrawn) A method for operating a cholesteric liquid crystal device comprising a cholesteric liquid crystal material, said method comprising  
applying a first electric field in a first direction to the cholesteric liquid crystal material to switch the cholesteric liquid crystal material between a transparent state and a reflective state, wherein the cholesteric liquid crystal material in said reflective state reflects  
15 light characterized by a first wavelength in the absence of an applied electric field, and  
applying a second electric field in a second direction, generally perpendicular to said first direction, to the cholesteric liquid crystal material in the reflective state to cause said cholesteric liquid crystal material to reflect light characterized by a second wavelength distinct from the first wavelength.

20 16. (withdrawn) The method of claim 15 wherein the second electric field is obtained by applying a voltage across the second electrodes between about 5 to 500 volts.

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17. (withdrawn) The method of claim 15 wherein the first wavelength corresponds to a blue color and wherein the second wavelength is greater than the first wavelength to correspond to a color with the green or red ranges.

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**EVIDENCE APPENDIX (none)**

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**RELATED PROCEEDINGS APPENDIX (none)**